

**REMARKS**

In the non-final Office Action, the Examiner rejects claims 79-114 under 35 U.S.C. § 103(a) as allegedly being unpatentable over LIDDY et al. (U.S. Patent No. 6,026,388) in view of YAYOI et al. (U.S. Patent No. 7,130,849). Applicants respectfully traverse this rejection.

By way of the present amendment, Applicants amend claims 79, 80, 82-91, 95-97, 99-108, 112-115, and 117 to improve form, and add new claims 118-122. No new matter has been added by way of the present amendment. Claims 79-122 are pending.

**Rejection under 35 U.S.C. § 103 based on LIDDY et al. and YAYOI et al.**

Claims 79-114 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over LIDDY et al. in view of YAYOI et al. Applicants respectfully traverse this rejection.

Independent claim 79 recites a method that is performed by one or more server devices. The method includes storing, in a memory of the one or more server devices, search query-search document associations in a database, each search query-search document association representing a one-to-one pairing of an issued search query and a search document; receiving, by one or more processors of the one or more server devices, a search query; identifying, by one or more processors of the one or more server devices, a set of search result documents using the received search query; and formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on at least one of the search result documents and at least one search query-search document association in the database. LIDDY et al. and YAYOI et al.,

whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, LIDDY et al. and YAYOI et al. do not disclose or suggest formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on at least one of the search result documents and at least one search query-search document association in a database relating to the at least one search result document, where each search query-search document association represents a one-to-one pairing of an issued search query and a search document. The Examiner relies on column 8, lines 12-47 of LIDDY et al. and column 7, lines 19-44; column 8, lines 26-51; column 9, lines 3-16; and column 14, lines 26-42 of YAYOI et al. as allegedly disclosing this feature (Office Action, pg. 3). Applicants respectfully disagree with the Examiner's interpretation of LIDDY et al. and YAYOI et al.

At column 8, lines 12-47, LIDDY et al. discloses generating an alternative representation of a query. LIDDY et al. does not disclose that this alternative representation is generated based on at least one of the search result documents and at least one search query – search document association in a database relating to the at least one search result. Thus, LIDDY et al. does not disclose or suggest formulating, by a processor, a search query refinement suggestion based on at least one of the search result documents and at least one search query-search document association in a database relating to the at least one search result document, where each search query-search document association represents a one-to-one pairing of an issued search query and a search document, as recited in claim 79. In fact, this section of LIDDY et al. does not

even mention a search query – search document association that represents a one-to-one pairing of an issued search query and a search document.

At column 7, lines 19-44, YAYOI et al. discloses:

The main memory 107 stores a system control program 110 for controlling the entire retrieval system, a document registration program 111 for registering documents to be retrieved, and a retrieval control program 112 for controlling retrieval processes.

The retrieval control program 112 comprises a query vector generation program 113 for generating a query vector at the first retrieval; a first information storage program 114 for maintaining the most recent retrieved result; a query vector modification program 115 for modifying the query vector based on an evaluation for the retrieved result; a similarity-based retrieval execution program 116 for executing the similarity-based retrieval using the query; a retrieved result output program 117 for outputting a result of the similarity-based retrieval; a quit criterion calculation program 118 for calculating a quit criterion using a search result; and a quit criterion output program 119 for outputting the calculated quit criterion.

There are provided a query vector storage area 120, a first information storage area 121, and a work area 122. The query vector storage area 120 stores a query vector, i.e., a set of a characteristic string used as a query for the similarity-based retrieval and a weight for the characteristic string. The first information storage area 121 stores the most recent retrieved result. The work area 122 stores other temporary data.

This section of YAYOI et al. discloses that the retrieval control program includes a query vector generation program for generating a query vector at the first retrieval; a first information storage program for maintaining the most recent retrieved result; a query vector modification program for modifying the query vector based on an evaluation of the retrieved result; a similarity-based retrieval execution program for executing the similarity-based retrieval using the query; a retrieved result output program for outputting a result of the similarity-based retrieval; a quit criterion calculation program for calculating a quit criterion using a search result; and a quit criterion output program for outputting the calculated quit criterion. This section of YAYOI et al. discloses modifying a query vector based on an evaluation of a retrieved result. YAYOI et al. does not

disclose formulating a search query refinement suggestion. Rather, YAYOI et al. discloses modifying a query vector. The query vector of YAYOI et al. does not reasonably correspond to the search query of claim 79 because the query vector and the modified query vector are both based on a single query.

Furthermore, even if modifying a query vector of YAYOI et al. can reasonably be construed as corresponding to formulating a search query refinement suggestion of claim 79 (a point with which Applicants do not agree), YAYOI et al. does not disclose or suggest modifying a query vector based on at least one of the search result documents and at least one search query – search document association in a database. Rather, the query vector modification is based on a relevant document and the document vector of the relevant document (column 2, line 59 – column 3, line 2). YAYOI et al. does not disclose a search query – search document association representing a one-to-one pairing of an issued search query and a search document. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on at least one of the search result documents and at least one search query-search document association in a database relating to the at least one search result document, where each search query-search document association represents a one-to-one pairing of an issued search query and a search document, as recited in amended claim 79.

At column 8, lines 26-51, YAYOI et al. discloses:

At step 403, the first information storage program 114 is activated to store a retrieved result before performing a second, refined retrieval based on the relevance feedback in the first information storage area 121. Then, the similarity-based retrieval execution program 116 is activated to perform a similarity-based retrieval using a query vector stored in the query vector storage area 120. Then, the retrieved result output program 117 is activated to output a result of the similarity-based retrieval performed by the similarity-based retrieval execution

program 116 to the display 101. Then, the quit criterion calculation program 118 is activated to calculate a quit criterion as a criterion to quit the relevance feedback. Then, the quit criterion output program 119 is activated to output the quit criterion calculated by the quit criterion calculation program 118.

At step 404, the retrieval control program 112 reads a command entered from the keyboard 102.

At step 405, the retrieval control program 112 checks the command entered at step 404. If the command is to evaluate whether the user considers "relevant" or "not relevant" the documents contained in the retrieved result of the similarity-based retrieval output to the display 101 by the retrieved result output program 117, the query vector modification program 115 is activated at step 407 to modify the query vector based on the evaluation command.

This section of YAYOI et al. discloses performing a similarity-based retrieval using a query vector. This section of YAYOI et al. further discloses modifying the query vector based on a command to evaluate whether a user considers retrieved documents to be "relevant" or "not relevant." As noted above, modifying the query vector does not correspond to formulating a search query refinement suggestion because the modified query vector is based on the same query as the original query vector. Therefore, query of YAYOI et al. discloses formulating query vector refinement suggestion and does not disclose or suggest formulating a search query refinement suggestion.

Furthermore, as noted above, even if modifying a query vector of YAYOI et al. can reasonably be construed as corresponding to formulating a search query refinement suggestion of claim 79 (a point with which Applicants do not agree), YAYOI et al. does not disclose or suggest modifying a query vector based on at least one of the search result documents and at least one search query – search document association in a database. Rather, the query vector modification is based on a relevant document and the document vector of the relevant document (column 2, line 59 – column 3, line 2). YAYOI et al. does not disclose a search query – search document association representing a one-to-one

pairing of an issued search query and a search document. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on at least one of the search result documents and at least one search query-search document association in a database relating to the at least one search result document, where each search query-search document association represents a one-to-one pairing of an issued search query and a search document, as recited in amended claim 79.

At column 9, lines 3-16, YAYOI et al. discloses:

The query vector generation program 113 reads a so-called query document into the work area 122 and extracts a characteristic string from the read query document. Here, the query document signifies a document that is entered from the keyboard 102 as a query for the similarity-based retrieval. The query vector generation program 113 counts the term frequency in the query document with respect to the extracted characteristic string. The query vector generation program 113 stores a set of the characteristic string and the term frequency as a query vector in the query vector storage area 120. The query vector is used for processes of the similarity-based retrieval execution program 116 to be described later.

This section of YAYOI et al. discloses that the query vector generation program reads a query document, extracts a characteristic string from the query document, counts the term frequency of the characteristic string, and stores a set of the characteristic string and the term frequency as a query vector. In other words, this section of YAYOI et al. discloses that a query vector is determined based upon the number of times particular strings of characters occur in a query document. This section of YAYOI et al. does not disclose or suggest formulating a search query refinement suggestion. Rather, this section of YAYOI et al. discloses that the query is input as a document. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on at least one of

the search result documents and at least one search query-search document association in a database relating to the at least one search result document, where each search query-search document association represents a one-to-one pairing of an issued search query and a search document, as recited in amended claim 79.

At column 14, lines 26-42, YAYOI et al. discloses:

Eq. 7 is used to calculate an inner product of query vectors before and after the re-retrieval. The quit criterion becomes 0 when execution of the query vector modification program 115 does not change the query vector direction.

An example of the embodiment will now be described with reference to FIG. 12. The example here assumes that the second retrieved result 1002 is obtained in the same manner as the process flow in FIG. 10. At this time, the query vector is modified from query vector 901 having weights (2,1,4,3) to the query vector 901a having weights (4,4,5,3).

Here, the quit criterion calculation program 123 calculates the quit criterion based on Eq. 7. The quit criterion 1201 is 0.078, as indicated by Eq. 8.

This section of YAYOI et al. discloses that the quit criterion becomes 0 when execution of the query modification program does not change the query vector direction. This section of YAYOI et al. has nothing to do with formulating a search query refinement suggestion based on a search result document and a search query – search document association. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a search query refinement suggestion based on at least one of the search result documents and at least one search query-search document association in a database relating to the at least one search result document, where each search query-search document association represents a one-to-one pairing of an issued search query and a search document, as recited in amended claim 79.

For at least the forgoing reasons, Applicants submit that claim 79 is patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination.

Claims 80-93 depend from claim 79. Therefore, these claims are patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 79.

Independent claims 94-96 and 111 recite features similar to features recited above with respect to claim 79. Therefore, claims 94-96 and 111 are patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination, for at least reasons similar to the reasons given above with respect to claim 79.

Claims 97-110 depend from claim 96. Therefore, these claims are patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 96.

Amended independent claim 112 recites a method that is performed by one or more server devices. The method includes creating, by one or more processors of the one or more server devices, a query source reference, including: identifying, by one or more processors of the one or more server devices, associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning, by one or more processors of the one or more server devices, a weight to each of the associations; receiving, by the processor, a search query; and formulating, by one or more processors of the one or more server devices, a refinement suggestion for the received search query using the query source reference. LIDDY et al. and YAYOI et al., whether taken alone



or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, LIDDY et al. and YAYOI et al. do not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations. The Examiner appears to rely on column 8, lines 12-47 of LIDDY et al. and column 7, lines 19-44; column 8, lines 26-51; column 9, lines 3-16; and column 14, lines 26-42 of YAYOI et al. as allegedly disclosing this feature (Office Action, pg. 3). Applicants respectfully disagree with the Examiner's interpretation of LIDDY et al. and YAYOI et al.

As noted above, at column 8, lines 12-47, LIDDY et al. discloses generating an alternative representation of a query. LIDDY et al. does not disclose that this alternative representation is generated based on at least one of the search result documents and at least one search query – search document association in a database relating to the at least one search result. Thus, LIDDY et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations, as recited in claim 112. In fact, this section of LIDDY et al. does not even

mention associations between issued search queries and retrieved search documents in a one-to-one relation.

At column 2, line 31 – column 3, line 16, YAYOI et al. discloses modifying a query vector based on a document vector of a document that a user evaluates as relevant. This section of YAYOI et al. discloses modifying a query vector and does not disclose or suggest formulating a refinement suggestion for a received search query. The query vector of YAYOI et al. does not correspond to the search query of claim 112 because the query vector and the modified query vector of YAYOI et al. correspond to the same query. Furthermore, YAYOI et al. does not disclose or suggest identifying associations between issued search queries and retrieved search documents in a one-to-one relation. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations, as recited in claim 112.

As noted above, at column 7, lines 19-44, YAYOI et al. discloses that the retrieval control program includes a query vector generation program for generating a query vector at the first retrieval; a first information storage program for maintaining the most recent retrieved result; a query vector modification program for modifying the query vector based on an evaluation of the retrieved result; a similarity-based retrieval execution program for executing the similarity-based retrieval using the query; a retrieved result output program for outputting a result of the similarity-based retrieval; a quit criterion

calculation program for calculating a quit criterion using a search result; and a quit criterion output program for outputting the calculated quit criterion. This section of YAYOI et al. discloses modifying a query vector based on an evaluation of a retrieved result. YAYOI et al. does not disclose formulating a refinement suggestion for a received search query. Rather, YAYOI et al. discloses modifying a query vector. The query vector of YAYOI et al. does not reasonably correspond to the search query of claim 112 because the query vector and the modified query vector are both based on a single query.

Furthermore, even if modifying a query vector of YAYOI et al. can reasonably be construed as corresponding to formulating a refinement suggestion for a received search query of claim 112 (a point with which Applicants do not agree), YAYOI et al. does not disclose or suggest modifying a query vector using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations. Rather, the query vector modification is based on a relevant document and the document vector of the relevant document (column 2, line 59 – column 3, line 2). Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations, as recited in claim 112.

As noted above, at column 8, lines 26-51, YAYOI et al. discloses performing a similarity-based retrieval using a query vector. This section of YAYOI et al. further

discloses modifying the query vector based on a command to evaluate whether a user considers retrieved documents to be “relevant” or “not relevant.” As noted above, modifying the query vector does not correspond to formulating a refinement suggestion for a received search query because the modified query vector is based on the same query as the original query vector. Therefore, YAYOI et al. discloses formulating query vector refinement suggestion and does not disclose or suggest formulating a refinement suggestion for a received search query.

Furthermore, as noted above, even if modifying a query vector of YAYOI et al. can reasonably be construed as corresponding to formulating a refinement suggestion for a received search query of claim 112 (a point with which Applicants do not agree), YAYOI et al. does not disclose or suggest modifying a query vector using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations. Rather, the query vector modification is based on a relevant document and the document vector of the relevant document (column 2, line 59 – column 3, line 2). Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations, as recited in claim 112.

As noted above, at column 9, lines 3-16, YAYOI et al. discloses that the query vector generation program reads a query document, extracts a characteristic string from

the query document, counts the term frequency of the characteristic string, and stores a set of the characteristic string and the term frequency as a query vector. In other words, this section of YAYOI et al. discloses that a query vector is determined based upon the number of times particular strings of characters occur in a query document. This section of YAYOI et al. does not disclose or suggest formulating a refinement suggestion for a received search query. Rather, this section of YAYOI et al. discloses that the query is input as a document. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations, as recited in claim 112.

As noted above, at column 14, lines 26-42, YAYOI et al. discloses that the quit criterion becomes 0 when execution of the query modification program does not change the query vector direction. This section of YAYOI et al. has nothing to do with formulating a refinement suggestion for a received search query using a query source reference. Therefore, this section of YAYOI et al. does not disclose or suggest formulating, by one or more processors of the one or more server devices, a refinement suggestion for a received search query using a created query source reference, where creating the query source reference includes identifying associations between issued search queries and retrieved search documents in a one-to-one relation, and assigning a weight to each of the associations, as recited in claim 112.

For at least the forgoing reasons, Applicants submit that claim 112 is patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination.

Claims 113-115 depend from claim 112. Therefore, these claims are patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 112.

Independent claims 116 and 117 recite features similar to features recited above with respect to claim 112. Therefore, claims 116 and 117 are patentable over LIDDY et al. and YAYOI et al., whether taken alone or in any reasonable combination, for at least reasons similar to the reasons given above with respect to claim 112.

### **New Claims**

New claims 118 and 119 depend from claim 95, new claims 120 and 121 depend from claim 116, and new claim 122 depends from claim 117. Therefore, new claims 118-122 are patentable over the art of record for at least the reasons given above with respect to claims 95, 116, and 117.

### ***Conclusion***

In view of the foregoing amendments and remarks, Applicants respectfully request the Examiner's reconsideration of this application, and the timely allowance of the pending claims.

As Applicants' remarks with respect to the Examiner's rejections overcome the rejections, Applicants' silence as to certain assertions by the Examiner in the Office Action or certain requirements that may be applicable to such assertions (e.g., whether a reference constitutes prior art, reasons for modifying a reference and/or combining

references, assertions as to dependent claims, etc.) is not a concession by Applicants that such assertions are accurate or that such requirements have been met, and Applicants reserve the right to dispute these assertions/requirements in the future.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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